Resistors and Capacitors Color Codes

RESISTORS

The charts following reflect how color codes are designated for both resistors and capacitors. While not every combination is shown, most popular color codes markings are indicated.
Some resistors have the ohmic value and tolerance printed right on the side of the resistor itself. It is easy to identify this type of resistor. The alpha-numeric code may be broken down as follows :
EXAMPLE : part number RN60D1001F

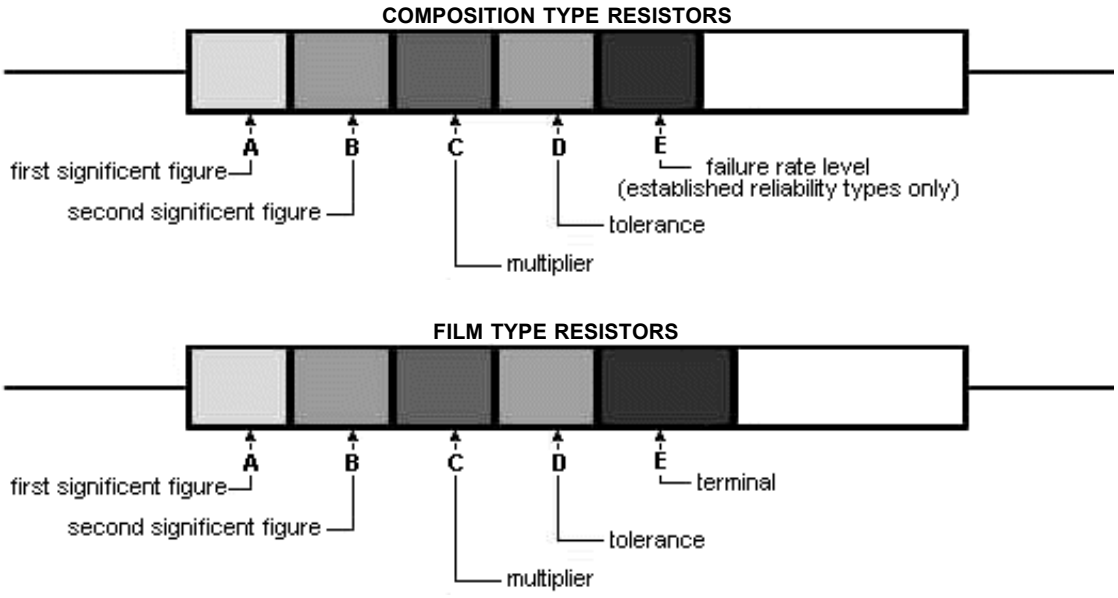
RN This code represents the type of resistor. This designation refers to a high stability, fixed film resistor. Other designations are **RCR** (a carbon resistor) and **RW** (a fixed wire wound resistor)

60 This number represents the power rating of the resistor (wattage). In this case, the power rating is 1/8 watt. Other examples are **10** (1/4 watt) and **25** (1 watt)

D This letter designates the temperature coefficient, usually stated in PPM/° C. This resistor has a temperature coefficient of 200 PPM/° C.

1001 This is the ohmic value of the resistor. The last number in this group of numbers represents how many zeros are to be added to the remaining group of numbers. For 1001, the value is 100 ohms with one zero added to it, or 1000 ohms. Another example is 4023; this indicates 402 ohms with three zeros added, or 402,000 ohms. Another code indicates fractional values. In 53R4, the **R** stands for a decimal place, so this value is 53.4 ohms. **F** This code represents the tolerance of the resistor. The **F** is 1%. The other codes used are as follows: **G** = 2%; **J** = 5%; **K** = 10%, and **M** = 20%.

COLOR CODE MARKING FOR RESISTORS



NOTE : BANDS "A" THRU "D" ARE OF EQUAL WIDTH

Band A : The first significant figure of the resistance value.
Band B : The second significant value of the resistance value.
Band C : The multiplier is the factor by which the two significant figures are multiplied to yield the nominal resistance value.

Band D : The resistor's tolerance
Band E : When used on composition resistors, band E indicates the established reliability failure rate level. On film resistors, this band is approximately 1.5 times the width of the other bands, and indicates type of terminal.

COLOR CODE CHART

BAND "A"		BAND "B"		BAND "C"		BAND "D"		BAND "E"		
COLOR	1st FIG	COLOR	2nd FIG	COLOR	MULTIPLIER	COLOR	TOLERANCE	COLOR	FAIL RATE	TERMINAL
BLACK	0	BLACK	0	BLACK	1	SILVER	± 10%	BROWN	1%	
BROWN	1	BROWN	1	BROWN	10	GOLD	± 5%	RED	0.1%	
RED	2	RED	2	RED	100	RED	± 2	ORANGE	0.01%	
ORANGE	3	ORANGE	3	ORANGE	1000	NONE	± 20%	YELLOW	0.001%	
YELLOW	4	YELLOW	4	YELLOW	10000			WHITE		SOLDER
GREEN	5	GREEN	5	GREEN	100000					
BLUE	6	BLUE	6	BLUE	1000000					
PURPLE (VIOLET)	7	PURPLE (VIOLET)	7							
GRAY	8	GRAY	8	SILVER	0.01					
WHITE	9	WHITE	9	GOLD	0.1					

Bad **B**ooze **R**ots **O**ur **Y**oung **G**uts **B**ut **V**odka **G**oes **W**ell

CAPACITORS

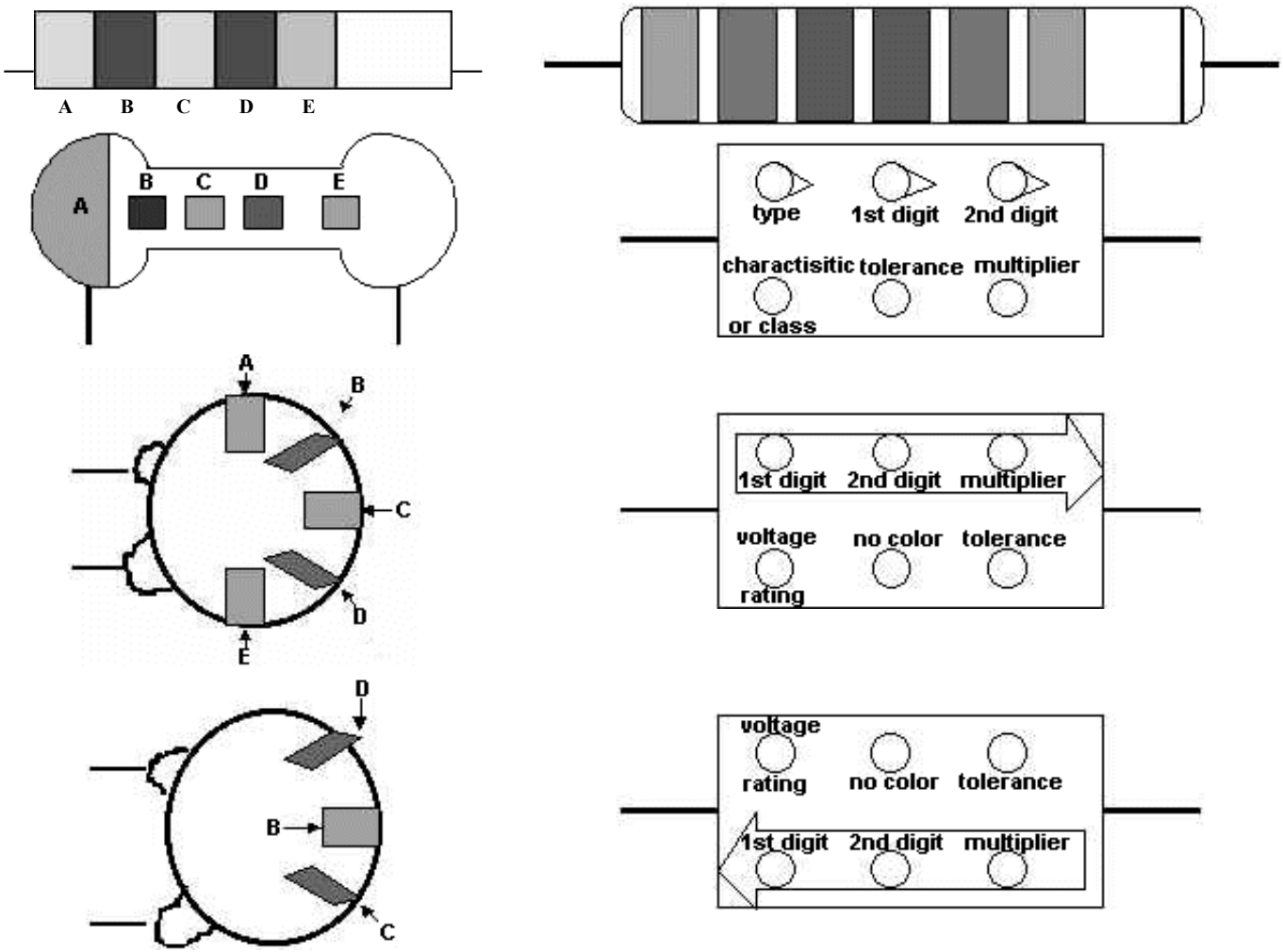
Different marking schemes are used on capacitors mainly because of the varying needs fulfilled by the various capacitor types. Temperature coefficient is of minor importance in an electrolytic filter capacitor, but it is very important in ceramic trimmers for attenuator use. you never find temperature coefficient on an electrolytic label, but it is always present on ceramic trimmers.

CERAMIC DISC CAPACITORS: Information is usually printed. M = ± 20%

K = ± 10%
J = ± 5%
G = ± 2%
F = ± 1%
Capacitance is in pf. Capacitance tolerance is shown in percent or by letter. Temperature coefficient is indicated by P200 which means +200ppm/° C which means +200 P/M/° C, or N100 for -100 P/M/° C, etc.
CERAMIC TUBULAR CAPACITORS: These capacitors are usually white enamel coated with parallel radial leads and look like "dog bones". The code consists of color dots which indicate temperature coefficient, capacitance, and tolerance

BUTTON MICA CAPACITORS: The most difficult part of reading the code on these capacitors is to remember to read the dots moving in a clockwise direction. The dots are usually printed more to one side than the other.
MOLDED MICA CAPACITORS: This was once a very popular type, rectangular with dots and arrow or similar directional indicator. Standard color code applies.
DIPPED MICA CAPACITORS: This type of capacitor has a printed label like that appearing on ceramic disk capacitors.
PAPER AND FILM CAPACITORS: Aluminum and tantalum electrolytic capacitors, in nearly all cases, have printed or stamped labels indicating capacitance, tolerance, and voltage ratings. Other characteristics are usually unimportant.
AIR TRIMMERS: The same information applies as with paper and film capacitors. Often, only the range is indicated.

CAPACITOR COLOR CODES



Voltage rating E
No Color A - Temperature Coefficient
Tolerance B - 1st Digit
C - 2nd Digit
D - Multiplier
E -Tolerance

CAPACITOR COLOR CODE NUMBERING SYSTEMS

6-DOT RMA-JAN-AWS Standard Capacitor Color Code

COLOR	TYPE	1st DIGIT	2nd DIGIT	MULTIPLIER	TOLERANCE (percent)	CHARACTERISTIC or CLASS
Black	JAN Mica	0	0	1		
Brown		1	1	10	1	Applies to
Red		2	2	100	2	temperature
Orange		3	3	1000	3	coefficients or
Yellow		4	4	10000	4	methods of testing
Green		5	5	100000	5	
Blue		6	6	1000000	6	
Purple		7	7	10000000	7	
Gray		8	8	100000000	8	
White	RMA mica	9	9	1000000000	9	
Gold				.1		
Silver	AWS paper			.01	10	
Body					20	

5-Color Capacitor Color Code

COLOR	1st DIGIT	2nd DIGIT	MULTIPLIER	TOLERANCE (percent)	VOLTAGE
Black	0	0	1		
Brown	1	1	10	1	100
Red	2	2	100	2	200
Orange	3	3	1000	3	300
Yellow	4	4	10000	4	400
Green	5	5	100000	5	500
Blue	6	6	1000000	6	600
Purple	7	7	10000000	7	700
Gray	8	8	100000000	8	800
White	9	9	1000000000	9	900
Gold			.1		1000
Silver			.01	10	2000
Body				20	

Ceramic Capacitor Color Code

COLOR	1st DIGIT	2nd DIGIT	MULTIPLIER	TOLERANCE over 10pf	TOLERANCE under 10 pf	TEMPERATURE
Black	0	0	1	± 20%	2.0 pf	0
Brown	1	1	10	± 1%		-30
Red	2	2	100	± 2%		-80
Orange	3	3	1000			-150
Yellow	4	4	10000			-220
Green	5	5		± 5%	0.5 pf	-330
Blue	6	6				-470
Purple	7	7				-750
Gray	8	8	.01		0.25 pf	+30
White	9	9	.1	± 10%	1.0 pf	+500 to -330
Gold				aaaaa		+100

[HBIndex] [Top of Page]